

## **Workforce Challenges in Advanced Manufacturing**

There are three generational demographic challenges facing Michigan as well as the rest of the United States. 1) The baby boomers are beginning to age out of the workforce, reducing labor supply at the same time they create additional demands by virtue of the aging process. 2) Michigan will start losing population in the 20-64 age range in 2014, and will quickly reach losses of over 20,000 a year, starting in 2018. Some 40,000 per year turn age 65 beginning as 2012. 3) There will be significant declines in the number of school age children in Michigan. These statistics represent substantial workforce challenges in advanced manufacturing as Michigan's available workforce declines.

The challenges are not only statistical. Tomorrow's workforce will need a different set of skills. Michigan will need to provide engineers who not only have math and science skills but who can relate those skills to the global economy and to the liberal arts. Tomorrow's workforce also must be entrepreneurial. Those skills will not only be needed as many individuals form their own companies but also to help employees succeed as corporations of the future become more entrepreneurial.

In addition, Michigan's workforce must be committed to technology transfer within companies, within universities and within industries. They also must be able to work with new technologies in advanced manufacturing such as alternative energy, nanotechnology, and others.

Corporations say they can train people if they have the basic skills, which too often are lacking. These companies also want more training money but are well aware of the need for accountability. They suggest creating a statewide program that either monitors how the money is spent or gives companies the money, or the tax credit, after the training is completed.

Michigan is a leader in advanced automotive design and technology. To continue that leadership we must work closely with our companies, our universities and our entrepreneurs to bring emerging technologies out of the R&D labs and into the marketplace. Michigan has the talent and the ability to lead in promising new technologies such as fuel cells and micro- and nanotechnology. These crossover technologies have application not only in advanced automotive technologies but also in life sciences and homeland security. Bringing these technologies to life will provide jobs for Michigan citizens and increased profits for Michigan's companies.

We need to help bring these technologies to market and to develop the workforce needed to reach that goal.

### **Job Openings in Manufacturing (examples)**

- Mechanical engineers
- Computer engineers
- Software engineers
- Biomechanical engineers
- Robotics engineers
- Mold builders

- Home appliance technicians. (Lake Michigan Community College graduated 36 people in that field recently – 30 had immediate job offers)

### **Skill Gaps**

- Project management skills
- Understanding of team concept
- Ability to know when to lead and when to follow
- A mindset committed to life-long learning.
- Good old fashion savvy
- Basic problem solving
- Manufacturing expertise
- Understanding of global issues
- Understanding of link between economics and business
- Inability to adapt quickly to change
- Collaboration skills
- Communication skills, including interpersonal skills
- Critical and systems thinking
- Entrepreneurship

### **Other Gaps**

- Apprentice programs not attracting young people
- There is no a statewide strategy for workforce development. It has been done in the heart of the communities
- Kids are not ready for their jobs
- The health care jobs idea is interesting but people can't be retrained to work in health care in a few months. They aren't ready for these jobs.
- Community colleges spend too much time getting students up to speed from K-12. This remedial training is expensive and taking away from the students' post-secondary education.
- Develop communications programs that encourage parents / students to embrace manufacturing jobs as good jobs

### **Suggested Strategic Actions**

#### ***Create Educational Network***

- Many of Michigan's manufacturing associations, companies and other organizations offer terrific educational programs that can be leveraged to help our workforce develop the skills they need to secure jobs today and in the future. A task force should be created to benchmark the current educational programs at states, associations, companies and so on and develop a one-stop clearing house for the programs so all Michigan companies are aware what's offered.

#### ***Increase Internship / Apprenticeship Opportunities***

- Invest in apprenticeship and internship programs and develop a communications strategy to make those opportunities known statewide
- Invest in more pre-apprenticeship programs. (For example, Lake Michigan College recently launched a Pre- Apprenticeship Academy that uses classroom and hands-on experience designed to develop entry-level skills for individuals who want to pursue a precision metal forming career, including a registered apprenticeship. The program also targets traditional engineering

students attending university programs who would like to augment their theoretical training with practical experience.)

- Add more physics classes in high school

### ***Improve K-12 education***

- The State should adopt a common standard for measuring skills. NIMS was mentioned as one possibility as was NACFAM's program
- License a company to create and/or teach classes that develop basic problem solving (i.e. KepnerTregoe – The Rational Manager)
- Create a world-class manufacturing curriculum with its roots in K-12
- Create a task force to benchmark current programs at states, associations, companies, etc. Create an umbrella program using the best of those.

Examples include:

- ***SAE's A World in Motion*** -- now in its 16th academic year of distribution, makes the challenges of math and science exciting by bringing authentic engineering design experiences into the classroom. The AWIM program is comprised of a series of four curricula referred to as Challenges for students in grades 4 -10. Designed by the Society of Automotive Engineers International (SAE), the AWIM curriculum joins together teachers, students, and volunteer practicing engineers and scientists in an exploration of physical science.
- ***Focus Hope***
- ***Jobs for America's Graduates***, or JAG, is a school-to-career program implemented in 1,000 high schools, alternative schools, community colleges, and middle schools across the country and United Kingdom. JAG's mission is to keep young people in school through graduation and provide work-based learning experiences that will lead to career advancement opportunities or to enroll in a postsecondary institution that leads to a rewarding career.  
<http://www.jag.org/>
  - Michigan is not a member. Governor Engler refused to join.
  - Why not use this as part of a "Jobs for Michigan Graduates" program?
  - Charles Robb of Virginia is a big supporter
- Provide a young diverse group of engineers with a planned strategy and curriculum and send them to teach in schools. These young engineers would act as role models and attract women and minorities to the profession.
- Encourage smaller companies throughout the state to send qualified employees to teach in schools and provide them with a common curriculum.
- Offer teachers summer internships at companies so they get first-hand knowledge of how corporations work. It's a win-win. They are paid to do it. The corporations get seasoned interns and can share ideas that the teachers can go back and teach the students.
- Create a "pay-for-knowledge" program for teachers. Teachers, who take the initiative to learn, earn more.

### ***Increase Entrepreneurship***

- Encourage small entrepreneurial companies to teach entrepreneurship in schools (This fits in well with Governor Granholm's emphasis on entrepreneurship as well as the plans to offer more entrepreneurship classes in the high schools. Is there

a link to RSAs? Could the state offer tax breaks or grants to the companies participating? Perhaps foundations would help.)

- Add more entrepreneurial classes to high schools, colleges and universities

### ***Revamp College Recruiting***

- Change the way recruiting is done on college campuses. Today recruiters often come to campus, are given a slew of names and spend the rest of the day interviewing. By the end of the day, they can't remember which student is which. A better plan, which some companies have embraced, is to form a relationship with professors who specialize in specific areas and ask those professors to recommend students. These professors act as ambassadors for internships and even companies.
- Recruit more professors from universities and community colleges to teach at corporate learning centers or "universities."

### ***Promote Michigan's Diversity***

- Start rhetoric that promotes Michigan's diversity as our strength. Michigan is known as one of the most segregated states. We should promote diversity of the state – racial and ethnic, east and west side of Michigan, tourism, and manufacturing. This kind of inclusion will attract and retain more people.

### ***Further Develop Regional Skills Alliances***

- Improve RSAs by having the state spend money/time on them and learn more about real world issues
- Train state employees to work better with employers. Many do not understand the issues nor do they understand how to talk to employers. As a result, the connection between business and government is not there.
- Earmark some of the Jobs Tomorrow bond money and a revised MEGA plan to enhance tourism ... Cool Cities without bureaucracy.
- Create a MEGA type program for those who are in consulting and services and tie it to how these businesses are helping the local communities. Get local businesses and communities to participate
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### ***Suggested Policy Changes***

- The state's training grant process needs to be streamlined. In the past companies have applied for a grant and worked with the community college to get the training done. Now the company has to find a vendor, fill out numerous forms. The old way was faster and cheaper.
- The states fight too much among themselves and don't share best practices. We must have a unified approach to correcting the educational problems in this country. This would be a perfect issue for the National Governor's Association to tackle and push the political side. (Regional section of NGA).